

# The DX Bulletin

## SPECIAL REPORT

• America's Oldest Weekly Amateur Radio Publication •

Chod Harris VP2ML Editor

## THE HISTORY OF WAZ

Part 1 - The Beginning  
by Jim Maxwell W6CF

As most DXers have now heard, 1986 and 1987 are in a sense the **Golden Years** of DX. CQ Magazine has offered a special award during 1986 in recognition of the 50th "Golden" anniversary of the Worked All Zones program, and during 1987 the ARRL is similarly offering a "Golden Jubilee" DXCC certificate to commemorate the 50th anniversary of the DX Century Club, which will occur in September 1987.

WAZ and DXCC are among the most popular of the world-wide DX awards. In this brief history, we'll look at the origins and early days of WAZ, the "Older Brother" of the two.

### The Idea is Born

The 1930s was a period of change for DX. The last nail had by then been driven into the coffin of Spark by the vacuum tube. Stable, crystal controlled transmitters were the norm and receivers were being designed with stability and selectivity to match. A few hams were experimenting with VFOs and rotary beams. Working all continents, then the most widely recognized DX achievement, became an everyday occurrence. DXers began looking for new measures of their prowess.

Attempts were made as early as 1932 to create a country list, and one such list was even submitted to the IARU for its approval in 1934. But this attempt failed, for agreement could not be reached on the basic question of just how to define a "country." Other DX counting schemes were discussed by Clinton DeSoto W1CBD, in QST and by Bud Bane W6WB in his DX columns in the pages of the venerable San Francisco magazine Radio. This was more than ten years before the start of CQ Magazine, now the sponsor of WAZ.

So it may surprise some to note that the idea for WAZ appeared for the first time not in CQ, nor in Radio, nor even in QST, but in the November 1934 issue of R/9, then the third and smallest of the US ham journals with national distribution. In a five page unsigned article the rules for WAZ were given, together with a zone map and a tabulation of countries by zone. The article contained only the details of the WAZ scheme - certificates were mentioned as some future possibility, but were not offered in that first announcement.

What person or persons were responsible for the WAZ idea, for the rules, and for the zone descriptions, which remain essentially unchanged to this day? Unfortunately the identity of the creator or creators of WAZ seems to be lost. The only thing certain is that the publisher of R/9, Killian V. R. Lansingh W6QX had a hand in it.

The 1930s were depression years and the market simply could not support three national amateur radio journals. Accordingly in late 1935 K. V. R. "Alphabet" Lansingh bought Radio, merged it with R/9, and named the combined journal Radio starting with the January 1936 issue. The "new" DX scheme was announced in the February 1936 issue, and the era of WAZ then started in earnest under the careful guidance

of Herb Becker W6QD, by then the DX columnist for Radio.

### The First Worked All Zone Award

The road to WAZ was rocky in those days. Herb published the first WAZ Honor Roll in October 1936, with only 28 DXers having zone totals of 26 or more. None had reached the magic total of 40, and only six had achieved the 39 zone mark.

March 1937 brought the first confirmed WAZ, as announced in the pages of Radio for that month. The winner? J. Mahieu ON4AU, of Brussels. But this wasn't an overnight miracle - the rules placed no limits on QSO dates, and ON4AU's sole Zone 23 confirmation was for a 1928 QSO with AC4AA.

By then the WAZ Honor Roll included a phone section. Only seven DXers were listed on the phone Honor Roll, even with the bottom of the ladder at only 20 zones. The top dog on phone, W5BDB, had worked all of 27 zones. 98 calls were listed on the mixed Honor Roll. In those pre-SSB days, DX was considerably easier on CW than on phone!

The second WAZ was won by John Hunter G2ZQ, in June 1937. His last zone was supplied by the legendary Reg Fox AC4YN, in Zone 23. Zone 23 was by far the most difficult one for prewar North American WAZ hunters, although less difficult for DXers in other parts of the world. AC4YN, the only station regularly active from Zone 23, was running only 7 watts (!) to a Zepp antenna that favored Europe. Although AC4YN liked his DX as much as the next person, by the end of 1938 he had yet to work his first VE or W. Finally in January of 1939 AC4YN worked three US stations; he was just as thrilled as were the three lucky Ws. There was activity by other AC4 stations from time to time, but QSOs between Tibet and North America were extremely rare and always brought headlines when they took place.

In spite of regular hints in W6QD's column in Radio that a surprise was in the offing, WAZ certificates were never announced pre-war. The lack of wallpaper seemingly had no effect on the popularity of the hunt, however, for the WAZ Honor Roll listing grew each month, reaching 172 mixed and 38 on phone by the end of 1937. By mid-1939 the WAZ Honor Roll had become so unwieldy (shades of today's DXCC Honor Roll!) that its size was limited to 270 stations per month mixed mode, 90 on phone. 1939 ended with ON4AU on top with 40 zones and 158 countries, G2ZQ second with 40 zones and 148 countries. 43 were stuck at 39 zones, some with very respectable country totals. W2BHW (now W6PM) was tied with W8CRA for the top of the 39-zone rung with 156 countries. The top phone DXers, W3LE, had 123 countries in 38 zones.

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The Worked All Zones scheme first surfaced in R/9 Magazine in Nov., 1934.



## The History of Worked All Zones

(continued from page 1)

The third prewar WAZ was claimed by Fumio Horiguchi J5CC, as reported in Radio for January 1940. But this was to be the last WAZ for many years. The world was becoming filled with the madness of war. Amateur radio activities declined sharply as the war spread. The US at first declared itself neutral, and in support of this neutrality US hams were asked to avoid QSOs with many of those countries which were still on the air. Good DX became so scarce that Herb Becker finally changed the name of his monthly column from "DX and Overseas News" to "X-DX and Overseas News." The last of the monthly WAZ Honor Roll listings appeared in February 1941, and the last "X-DX" column appeared five months later, in July.

And so ended the beginning of WAZ. Many hundreds throughout the world had chased the elusive zones, but only three were successful in working and confirming them all before the spread of hostilities brought an temporary halt in amateur radio. The postwar explosion of interest in WAZ, by then sponsored by CQ Magazine, is another story, to be told later.

[Thanks to W6BCX, ex-W6BRO, ex-W6CUH, W6ENV, W6QD, and W6WB for many valuable comments and insights into the beginning days of WAZ! - Jim Maxwell W6CF]

[Jim Maxwell W6CF is an avid historian of DX, and maintains an extensive library of DX publications. Jim now edits the Northern California DX Club's, The DXer. Thanks to Jim for the careful research and fine summary of the early years of Worked All Zones. -ed.]

## DXCC Restructuring Net and List Ethics

Among the topics being considered by the DX Advisory Committee in its comprehensive study of DXCC is the question of operating ethics. In this issue The DX Bulletin looks at one aspect of operating ethics: net and list contacts.

Dear TDXB:

DXing can be closely compared to big game hunting. In any legitimate game hunting, the hunter will spend much time stalking and waiting his quarry out, looking for a clear sporting shot. If he bags his animal, he feels the hours of work have been worth it. Now, A DX net goes something like this: our hunter goes out into the bush, but instead of a fair-play hunt, he finds his lion (leopard, cape buffalo, etc.) chained to a tree, without a chance in the world. Our hunter simply points his rifle and fires. Kinda takes the fun out of the whole thing, doesn't it.

Let's say Clipperton is on and there is a pileup 5-10 kHz wide. It seems that every DXer in the States is on frequency. So we get in there and after much yelling (and possibly profanity) we finally work 'em, and we feel terrific. But now, let's see, Clipperton is running a net, and all we have to do is sit back calmly until our turn comes, and we utter the immortal words "5X9" into the mike. Seems to kinda take some of the icing off the cake, n'est pas?

No, OM, I have little respect for countries worked via nets. I have never worked a DX net.

(s) Terry Weinhold N3EUL

## Another Viewpoint

Dear TDXB:

In my view the DX nets have a place. They let "little guys" hooked on DX and feed our "sub-hobby," DX. And they help some DX stations make many more QSOs than they would make on their own. And they keep hundreds of DXers on one frequency, leaving me the rest of the band. On the other hand, they do make QSOs that don't exist.

(name withheld on request)

## TDXB's Viewpoint

DX nets and lists have their place, especially for inexperienced DX stations and ones with severe language difficulties. But they are used too often when they are not really necessary, and they do tend to promote non-existent contacts.

The latter problem is caused by the fact that the only piece of information "exchanged" in a net or list contact is the signal report. The stations already know each other's callsigns, and many signal reports are totally arbitrary. Or the station is given three or four chances to get the signal report correct, at which point it is confirmed by the net control. Thus to make a "valid" contact, the DXer need only check into the net; he might not even be able to hear the DX station!

A couple of suggestions to get around this problem of "non-existent" contacts: 1. Don't use full callsigns in the net or list. Then the DXer must get his or her callsign through to the DX station, at least. Or 2. Exchange another piece of information, such as a serial number (which would simplify QSLing as well.)

The other problem with nets or lists is overuse. Many fine free-style operators are pressured to join lists or nets, when they could work more DXers on their own. One well-known DX net even moved 50 kHz to swallow up a choice DX station operating free-style. Net control stations and list-takers must exercise restraint in soliciting DX stations for their nets and lists.

## DX Net Ethics

1. No net or single operator has the exclusive right to a specific frequency unless carrying emergency traffic in accordance with the generally accepted definition of such traffic.

2. In the event that a QSO is in progress on a so-called net frequency, the net must either wait until the QSO is terminated or alternatively establish the net elsewhere.

3. The net controller is responsible for ensuring that the net is conducted in an orderly manner and does not disturb any other traffic.

[From the Canadian Radio Relay League, endorsed by IARU Region 1 and 2.]

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## Mt. Athos - Followup

Dear TDXB:

I am sorry to bother you again about the same matter, but I really can't let anybody throwing mud at me without some answer!

[Manos essentially collaborates IØIJ's story, as presented in TDXB's Special Report, Nov. 1986, and continues,...] I really cannot see the point of this big effort from many people to present some actions from here [Greece] as "not in the true spirit of amateur radio." The question is what really is the spirit of amateur radio: to violate the laws of a country, insult the local people, making an operation from outside saying to be inside Athos, make mockery of previous operations, present forged licenses as original like DL7FT, or dressing an amateur operation with a scientific cover and call QSOs and pileups as research, or trying to throw mud to previous DXpeditions like IØDUD and company? If this is called "the amateur radio spirit," I agree with them because we don't have it.

I know and strongly believe that DXers ultimate dream is a new one added to the total score, but I also believe in some principles caused by true sportsmanship, operating ethics, etc. Besides that, if all papers were in order, nobody in the world could ever stop them.

[About the legality of my operation from Athos in 1980...] I had no problems to visit, stay, and operate from the monastery of Ivion in 1980 with my license in hand. I also have many pictures with my antenna on top of the monastery, as well as the whole gear installed inside the rooms, etc. In 1985 the monks could locate my license in their files, as I received an official copy, when I had misplaced my original. And an official copy sits in the files of the Police Department of Kariat. Another sad event in amateur radio's history, don't you think?

73, Manos SV1IW

### TDXB Comment

The lack of a file copy of Manos's 1980 operating permission is probably due to his request for an official copy last year; the original may not have made it back into place, if the monks' filing system is as primitive as the rest of their customs. And no one has accused Manos of not having official permission; IØIJ only mentioned that the file copy was not in the proper place to demonstrate the legitimate confusion that surrounds Mt. Athos paperwork.

The fact remains that the Greek amateurs immediately tried to stop IØIJ and friends, upon hearing of the Italians' success at obtaining Athos operating permission through their "ionospheric propagation study."

Manos writes, "SV2RE, the Vice President of our SV2 branch (of the RAAG), discovered the Italian paperwork at a meeting of the Ministry of Northern Greece in Thessalonica. With some surprise he saw that with the trick/dress of the scientific research, the Italian group is succeeding where the Greeks were having a negative reply when asking straight for an amateur DXpedition. SV2RE informed RAAG, and also complained through the local Ministry to the PTT and to the Ministry of Foreign Affairs. RAAG echoed the complaints, which had an immediate effect. The Italian license was changed and no transmitting was allowed, only receiving for the purpose of scientific research." [emphasis added]

Sorry, Manos. That sounds like sour grapes to The DX Bulletin. The Italians had legitimate operating permission, and it was local Greeks and the RAAG that cancelled that license, apparently because

the Greeks could not get permission to operate from Athos themselves. Regardless of the antics of DL7FT, the Greeks should not have stopped the Italian trip.

The other "private" DXCC countries enjoy reasonably regular activity from their "owners." Liga Colombiana de Radioaficionados mounts a major DXpedition to Malpelo HKØ every few years (maybe next time they'll work some W6s), and Radio Club Venezolano will activate Aves YVØ next Spring. Even little SMOM 1AØKM sees regular operation, under the close observation of IØMGM and others. The Mexicans has "protected" Revilla Gigedo XF4 for many years, but there are signs that even that tough nut is beginning to crack. For example, the 1985-86 Clipperton group has plans to operate from XF4 in March. Only Mt. Athos has a "protector" (in RAAG) who not only does not allow outsiders to operate, but can't even get permission themselves.

So, RAAG, The DX Bulletin sees three choices:

1. Apologize to the Italians and see if you can undo the damage done, and re-establish their license; or,
2. Mount a serious DXpedition to Mt. Athos yourselves; or,
3. Petition the DXAC to delete Mt. Athos, on the grounds the ARRL cannot determine the authenticity of licensing documents from Mt. Athos. (For example, the authenticity of the DL7FT operations of 1985 and 1986 has still not been decided, 18 months after the fact.)

It was, as you say, a sad event in amateur radio history, but in this case most of the blame must fall on RAAG for throwing a monkey wrench into the imaginative plans of the Italians. -ed.

### Radio Club of America Honors Ken Miller K6IR

Kenneth M. Miller K6IR was presented with the Radio Club of America's Sarnoff Award at the organization's annual awards banquet November 21, 1986.

The award, named after David Sarnoff, founder of the Radio Corporation of America, is given annually to the person who has made the most significant contribution to the advancement of electronic communication.

During his lifetime career in electronics and related industries, Mr. Miller has been responsible for many technological innovations. A pilot and engineer in the aircraft industry for many years, he developed the first automatic pilot for general aviation use, a life-saving automatic rudder control to prevent airplanes from falling into a fatal spiral, and the first solid state automatic direction finder for planes. With his then-boss Bill Lear, he created the first 8-track audio tape player and cartridge in the mid-1960's.

Before leaving the Penril Corporation earlier this year where he served as President, CEO, and Director for 13 years, he was responsible for the development and sales of that company's sophisticated product lines, including modems, test instruments, digital panel meters, high performance power supplies, and stereo systems.

Ken has been a licensed radio amateur for over 40 years. He holds an Extra class license, has more than 320 countries confirmed. He also is a licensed pilot and counts international travel and flying among his hobbies.

The Sarnoff Award singles out Ken Miller for his major contributions in radio communications and in applications of electronics to aviation, instrumentation, and computers; also for his leadership of the Radio Club's Grant-In-Aid scholarship program.

The DX Bulletin congratulates Ken K6IR for earning this prestigious award. -ed.



# EQUIPMENT NOTES

## Phase Noise in the Kenwood TS-940S

Phase Noise Improvements

by John Kaufmann W1FV

I tried both the Kenwood-recommended fix (see TDXB Special Report, Sept.) and the Lowe Electronics modification in my TS-940S. In this article I will report the results of detailed laboratory measurements on the radio for both transmit and receive with each of the modifications.

### Measurement Set-Up

Transmitter measurements were performed by operating key-down CW at rated output (about 100 watts) into a 50 ohm dummy load, while recording spectral data on a Hewlett-Packard 8566A spectrum analyzer. Receiver data was taken with a HP 8642B signal generator feeding a very clean 14200 kHz signal into the antenna port of the TS-940S, and a HP 3456A digital voltmeter measuring receiver audio output. The receiver was set up with AGC off, CW filters in (IRI 400 Hz filters), CW VBT off, and the audio filter out. The signal generator output was adjusted to a level of -43.0 dBm to produce a S9+30 dB signal on 14200 kHz. Receiver reciprocal mixing noise output at audio was measured as a function of frequency offset from 14200 kHz.

### Receiver Measurements

Table I summarizes the receiver performance for the stock unit, the Lowe, and the Kenwood modifications by comparing the noise levels at 1 kHz increments from the center frequency. The Lowe modification comes out on top by a large margin. Reciprocal mixing noise is reduced by 12-13 dB inside +/- 5 kHz, almost exactly the improvement that has been claimed. The main effect of the Kenwood modification is to introduce a "plateau" in the noise spectrum inside +/- 3 kHz or so. Outside this range it appears to be as noisy as a stock '940.

Table I

Receiver Noise Output for S9+30 dB CW Signal Input  
(dB Above Receiver Noise Floor)

Frequency Offset	Stock	Lowe Mod.	Kenwood Mod.
1 kHz	34 dB	23 dB	30 dB (spur)
2 kHz	28	15	26
3 kHz	24	15 (spur)	26
4 kHz	20	7	22
5 kHz	17	4	18
10 kHz	7	0	5

In on-the-air operation there are no apparent problems with regard to synthesizer lock-up time or tuning glitches as a result of either modification. The modified '940 tunes just like the stock '940.

There have been some reports of synthesizer switching problems in modified '940s in the QSK mode: especially in split frequency across adjacent 10 kHz sectors. It turns out that this problem has been documented as existing even in stock '940s, and therefore does not appear to be a modification-related effect.

### Transmitter Measurements

Transmitter phase noise output was measured over two ranges: +/- 5 and +/- 100 kHz from center. The close-in noise is of particular concern from the standpoint of potential adjacent-channel interference when transmitting.

Table II summarizes the transmitter performance of the various units. Once again, the Lowe-modified TS-940S is equal to or superior to the others, although the improvements over stock are not as

dramatic overall as the receiver improvements. Both modifications produce a significant noise reduction in close to the carrier. The Kenwood modification exhibits two spurs, +/- 1 kHz from center frequency. These undesired responses can be quite offensive to others during transmit, and can also result in significant out-of-band emission, if one crowds the band edge. It is evident that the greatest cleanup of the transmitter signal occurs only within 2 kHz or so for both modifications.

Table II

Transmitter Noise Output with Respect to Carrier  
in 100 Hz Bandwidth

Frequency Offset	Stock	Lowe Mod.	Kenwood Mod.
1 Khz	-62 dB	-74 dB	-72 dB
2 kHz	-71	-78	-74
3 kHz	-75	-79	-73
4 kHz	-77	-80	-74
5 kHz	-79	-80	-78

### Discussion and Conclusion

The Lowe modification of the TS-940S is the clear winner for both transmit and receive. The Kenwood modification falls short of yielding improvement "...on the order of 15 dB within the range of +/- 20 kHz..." as claimed in their service bulletin, at least in my '940. I was sufficiently disappointed by the results for the Kenwood modification that I double-checked my modification work but could find no flaws. Nonetheless it still represents an improvement over the stock TS-940S and is definitely a step in the right direction by Kenwood.

A few words about implementing the Lowe modification. One must be careful about component layout in attempting to install the additional circuitry. Any stray pickup of 60 Hz or other noise onto the signal lines involved can severely degrade the synthesizer noise performance, as I discovered in my first somewhat haphazard installation of this modification. All component leads should be as short and direct as possible. I mounted everything on a small PC board just along side the RF board (X44-1660-00) near the socket where the VC1 and VC2 lines connect via a 4-pin plug.

In actual use, the receiver improvements with the Lowe modification can be considered dramatic in some instances. The "hash" produced by strong signals is strikingly reduced, often to the point of being imperceptible. It is now much easier to copy weak signals in close to strong ones, provided the strong signals are themselves spectrally clean. In terms of receiver phase noise performance, the modified TS-940S now probably ranks among the best of the current crop of frequency-synthesized rigs, but still falls short of equalling the better non-synthesized radios such as the older Drake C-Line or Collins S-Line. The transmitter performance is significantly improved too, but principally at close-in frequencies only.

### Acknowledgements

Thanks go to my colleagues Dave Cipolle WA1UGE and Steve Alexander of MIT Lincoln Laboratories for help in carrying out the lab measurements. Also, useful discussions with Bill Myers K1GQ and Don Nelson NB1Y are gratefully acknowledged.

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[The Lowe modification was printed in the May 1986 Special Report of The DX Bulletin. Copies are available from The DX Bulletin for a business-sized SASE. W1FV hasn't yet tested the KF7L fix presented in the November Special Report. -ed.]